# INDEX TO VOLUME I


Acidosis: after adrenalectomy, 37; following $CO_2$ administration in thyroparathyroidectomized dogs, 175

Adrenalectomy: acidosis following, 37; sulphate retention in dogs following, 37; survival period in pregnant and lactating cats following, 147

Aggregates of dissociated cells: axial development of in *Corymorpha palma*, 419, 425; of naked stem region of *Corymorpha*, 422; forms developing from, in *Corymorpha*, 429; origin of polarity in, 433, 437, 451, 453; form frequencies in, in relation to differential exposure, 437; variations in size and proportions of, in *Corymorpha*, 442; development of tentacles in, 445, 455; origin of ectoderm and entoderm in, 449

Aggregations: temperature of ant, 344; studies in animal, 509

ALLEE, W. C., Studies in animal aggregations: mass protection for *Planaria* from ultra-violet radiation, 509

ALLEN, BENNET M., The influence of different parts of the hypophysis upon size growth of *Rana* tadpoles, 153

Amphibian metamorphosis, studies on, 463

Anesthetics: effects of, on cleavage reaction in sea-urchin eggs, 269

Antigen: preparation of, from testis and epididymis of rabbit, 101; injection of, into female rabbit, 102

Apical sectors in cell aggregates of *Corymorpha palma*, 431, 456

Apolar forms in cell aggregates of *Corymorpha palma* 433

*Arbacia:* period of maximum susceptibility to dilute sea-water in cleavage cycle of, 26; cytolysis of eggs of, in hypotonic sea-water, 30; effect of certain anesthetics on cleavage of, 269

Archenteron: infolding of blastular wall in *Patiria* in relation to, 56; in egg fragments of *Patiria*, 60, 67; in fused blastulae of *Patiria*, 65, 67

*Arphia xanthoptera*, regularity of respiratory movements in, 593

Asphyxiation, effect of, on parathyroid tetany in dogs, 174

Axial development in aggregates of dissociated cells of *Corymorpha palma*, 419, 425

BAUMBERGER, J. P., and DILL, D. R., A study of the glycogen and sugar content and the osmotic pressure of crabs during the molt cycle, 545

BAUMBERGER, J. P., and OLMSTED, J. M. D., Changes in the osmotic pressure and water content of crabs during the molt cycle, 531

Bipolar forms: in the reconstitution of *Pelmatohydra oligactis*, 190; in cell aggregates from *Corymorpha palma*, 429

Bipolar-unipolar forms in the reconstitution of *Pelmatohydra oligactis*, 192

Blood sulphate, method of determining, in adrenalectomized dogs, 39

BLUM, HAROLD F., On the physiology of the pallet mechanism of the shipworm, *Teredo navalis*, 416

BLUMENTHAL, REUBEN, The effects of certain anesthetics on the cleavage reaction in sea-urchin eggs, 269

Budding, experiments on, in *Pelmatohydra oligactis*, 214

Calcium ion, effect of, on heart rhythm of crayfish, 580, 589

Calcium-potassium ratio in culture media for *Planaria dorotocephala*, 137

*Callinectes sapidum*, glycogen and sugar content during molting of, 545

*Cambarus clarkii:* effect of various ions on heart rhythm of, 576; effect of sodium ion on heart rhythm of, 579, 589; effect of potassium and calcium ions on heart rhythm of, 580, 589; effect of magnesium ion on heart rhythm of, 584, 590; effect of hydrogen ion on heart rhythm of, 584, 590

*Cambarus immunis* (Hagen), respiratory regulation in, 76

Carbon dioxide, effect of, on parathyroid tetany, 172

Cell dissociation: in *Corymorpha palma*, 419; aggregation following, in *Corymorpha*, 420; results of, in naked stem region of *Corymorpha*, 422; results of, in hydranths, 424

CHILD, C. M., Axial development in aggregates of dissociated cells from *Corymorpha palma*, 419

*Chortophaga viridifasciata*, regularity of respiratory movements in, 593

Contractile vacuole: in encystment of *Euplotes taylori*, 568; in excystment of *Euplotes taylori*, 569

*Corymorpha palma:* axial development in aggregates of dissociated cells from, 419; method of cell dissociation in, 419; aggregation following dissociation in, 420, 422, 447; slight aggregation in cells of hydranths of, 424, 448; development of cell aggregates in, 425; forms developing from cell aggregates of, 429; origin of polarity in cell aggregates of, 433, 437, 451, 453; form frequencies in cell aggregates of, in relation to differential exposure, 437, 453; variation in size and proportion of forms developing from cell aggregates of, 442; development of tentacles in cell aggregates of, 445, 455; origin of ectoderm and entoderm in cell aggregates of, 449

Crabs: changes in osmotic pressure and water content during molt cycle of, 531, 537; increase in size of, in molting, 537; glycogen and sugar content of, during molting, 545

Crayfish: respiratory regulation in, 76; effect of various ions on heart rhythm of, 576; effect of sodium ion on heart rhythm of, 579; effect of potassium and calcium ions on heart rhythm of, 580; effect of magnesium ion on heart rhythm of, 584; effect of hydrogen ion on heart rhythm of, 584

Cytolysis: of *Arbacia* egg in hypotonic sea-water, 30; of *Nereis* egg in hypotonic sea-water, 125; of *Planaria* subjected to ultra-violet radiation, 513

Dedifferentiation in *Uronychia uncinata*, 8, 10, 19

Dehydration and hydration in the living cell, 122

Differentiation: of egg fragments in the starfish, *Patiria miniata*, 55; without cleavage in *Nereis limbata* in hypotonic sea-water, 128; of *Corymorpha* cell aggregates, 425, 429

DILL, D. R., and BAUMBERGER, J. P., A study of the glycogen and sugar content and the osmotic pressure of crabs during the molt cycle, 545

Dogs: sulphate retention in adrenalectomized, 37; effect of $CO_2$ administration on parathyroid tetany in, 172; relief of parathyroid tetany by injections of uranium nitrate in, 496

*Echinarachnius:* mitosis in, 28; susceptibility to hypotonic sea-water of egg of, 29, 30, 130, 132

Ectoderm, origin of, in cell aggregates from *Corymorpha palma*, 449

Egg fragments, development of, and fusion of blastulae from, in starfish, 55

ELIOT, THEODORE S., The influence of the gonads on the plumage of Sebright bantams, 286

Encystment: induced, in *Euplotes taylori*, 561; process of, in *Euplotes taylori*, 565

Entoderm: origin of, in cell aggregates of *Corymorpha palma*, 449

Ethyl acetate, effect of, on cleavage of *Arbacia*, 275

*Euplotes taylori:* induced encystment and excystment in, 561; diagnosis of, 562; process of encystment in, 565; process of excystment in, 569

Excystment: induced, in *Euplotes taylori*, 561; process of, in *Euplotes taylori*, 569

Form frequencies: in relation to length of piece and body level in *Pelmatohydra oligactis*, 196; effect of depression on, 201; in very small pieces, 204; in *Corymorpha* cell aggregates in relation to differential exposure, 437, 453

*Formica ulkei* Emery: hibernation of, 325; moisture conditions in nest of, during winter, 328; temperature conditions in nest of, during winter, 332; relation of, to other animals during winter, 334; activity of, during winter, 335; water content of workers of, during winter, 336, 353; temperature of aggregates of, 344; hibernation of, not profound, 350; sensitiveness of, to temperature, 350; temperature the chief factor in hibernation and emergence of, 351

Fusion of blastulae from egg fragments in starfish, 55

GARNJOBST, LAURA, Induced encystment and excystment in *Euplotes taylori*, sp. nov., 561

Geokinesis in young rats, 555

Geotropism, nature of apparent, in young rats, 550

GILCHRIST, FRANCIS G., The effect of a horizontal temperature gradient on the development of the egg of the urodele, *Triturus torosus*, 231

Glycogen during molt cycle of crabs, 545

Gonads: influence of, on plumage of Sebright bantams, 286; removal of, in Sebright bantams, 289; influence of, on growing feather, 311

HATERIUS, H. O., An experimental study of ovarian regeneration in mice, 45

Heart rhythm: effect of various ions on, in crayfish, 576; effect of sodium ion on, in crayfish, 579, 589; effect of potassium and calcium ions on, in crayfish, 580, 589; effect of magnesium ion on, in crayfish, 584, 590; effect of hydrogen ion on, in crayfish, 584, 590

HELFF, O. M., The respiratory regulation of the crayfish, *Cambarus immunis* (Hagen), 76; Studies on amphibian metamorphosis. III. The influence of the annular tympanic cartilage on the formation of the tympanic membrane, 463

*Hemigrapsus nudus*, changes in osmotic pressure and water content during molt cycle of, 531

*Hemigrapsus oregonensis*, changes in osmotic pressure and water content during molt cycle of, 531

HERBER E. C., and SLIFER, E. H., The regularity of respiratory movements of the Locustidae, 593

Hibernation: of the ant, *Formica ulkei*, 325; description of, in ant, 326; moisture conditions in nest of ant during, 328; temperature conditions in nest of ant during, 328; activity of ant during, 335; water content of worker ants during, 336, 353; respiration of ants during, 341

HINRICHS, MARIE A., Ultra-violet radiation and division in *Paramecium caudatum*, 394

HOLMQUIST, A. M., Studies in arthropod hibernation. II. The hibernation of the ant, *Formica ulkei* Emery, 325

HOVEY, H. BIRNET, The nature of the apparent geotropism of young rats, 550

Hydration and dehydration in the living cell, 122

Hydrogen ion, effect of, on heart rhythm of crayfish, 584, 590

Hydrogen-ion concentration: of blood of thyroparathyroidectomized dogs after injections of uranium nitrate, 500; of blood of crabs during molt cycle, 533

Hypophysis: influence on growth of tadpoles of different parts of, 153; removal and implantation of, in tadpoles, 156; influence of intermediate lobe of, on color of tadpoles, 157; influence of removal and implantation of, on development of thyroid, 161; influence of anterior lobe of, on growth of tadpoles, 164

Hypotony: susceptibility to, in cleavage cycle of *Arbacia*, 26; effect of extreme on eggs of *Nereis* and *Platynereis*, 122; as a means of inducing differentiation without cleavage in *Nereis*, 128; influence of, on wound contraction in *Planaria*, 138

Immunity, tests for, to sperm injections in rabbit, 102

Insect development, effect of temperature on, 358

Iso-propyl alcohol, effect of, on cleavage of *Arbacia*, 275

JUST, E. E., Studies in cell division. II. The period of maximum susceptibility to dilute sea-water in the cleavage cycle of the fertilized egg of *Arbacia*, 26; Hydration and dehydration in the living cell. I. The effect of extreme hypotony on the eggs of *Nereis*, 122

Krogh's formula of relation between temperature and rate of development, application of, to development of *Popillia japonica*, 381

LINDEMAN, VERLUS F., The physiology of the crustacean heart. I. The effect of various ions upon the heart rhythm of the crayfish, *Cambarus clarkii*, 576

Locustidae, regularity of respiratory movements in, 593

LUDWIG, DANIEL, The effects of temperature on the development of an insect (*Popillia japonica* Newman), 358

Magnesium ion, effect of, on heart rhythm of crayfish, 584, 590

*Melanoplus differentialis*, regularity of respiratory movements in, 593

*Melanoplus femur-rubrum*, regularity of respiratory movements in, 593

Metabolic gas exchange measurements, a source of error in, 380

Methyl alcohol, effect of, on cleavage of *Arbacia*, 275

Methyl cyanide, effect of, on cleavage of *Arbacia*, 275

Mice: ovarian regeneration in, 45; ovariectomy in, 47

Mitosis, discussion of factors in, 26

Molt cycle: changes in osmotic pressure and water content of crabs during, 531, 545; stages of, in crabs, 532; glycogen and sugar content during, in crabs, 545

Mosaic forms in cell aggregates from *Corymorpha palma*, 431

Multipolar forms: in the reconstitution of *Pelmatohydra oligactis*, 192; in cell aggregates from *Corymorpha palma*, 429, 455

MURRAY, MARGARET R., The calcium-potassium ratio in culture media for *Planaria dorotocephala*, 137

*Nereis limbata:* effect of extreme hypotony on eggs of, 122; cytolysis in eggs of, in distilled water, 125; differentiation without cleavage in, 128; water-holding capacity of eggs of, 129

N-propyl alcohol, effect of, on cleavage of *Arbacia*, 275

OLMSTED, J. M. D., and BAUMBERGER, J. P., Changes in the osmotic pressure and water content of crabs during the molt cycle, 531

Orchectomy, effects of, in Sebright bantams, 291

Osmotic pressure, of body fluid of crabs during molt cycle, 536, 537, 545

Ovariectomy: in mice, 47; effect of, in Sebright bantams, 294, 309

Oxygen consumption: in relation to oxygen tension, 76, 83; method of determining, 78; normal variation in, 80; effect of hydrogen-ion concentration on, 90

Oxygen tension: influence of, on respiration, 76, 83; behavior of crayfish under different, 84

*Pachygrapsus crassipes:* changes in osmotic pressure and water content during molt cycle of, 531; sugar content during molt cycle of, 548

Pallet mechanism of *Teredo navalis*, 416

*Paramecium caudatum:* effect of ultra-violet radiation on division of, 394; permanent pairs and chains of, 404; behavior of chains of three and four cells of, 407; higher susceptibility to ultra-violet radiation of dividing, 409; monster formation by ultra-violet radiation in, 409

Parathyroid tetany: effect of $CO_2$ administration on, 172; relief of, by injections of uranium nitrate, 496

Parathyroidectomy in dogs, 499

*Patiria miniata:* localization and fusion of blastulae from egg fragments in, 55; method of operation on eggs of, 56; infolding in blastulae of, 56; development of egg fragments of, 58, 66; archenteron in egg fragments and fused blastulae of, 60, 65, 67

*Pelmatohydra oligactis:* reconstitution and budding in, 183; form frequencies in reconstitution of, 196, 201, 204; rate of tentacle formation in relation to body level in, 208

Physiological gradients: in *Pelmatohydra oligactis*, 183, 211; in relation to temperature gradients, 231; in *Corymorpha* cell aggregates, 452, 459

*Planaria dorotocephala:* culture media for, 137; influence of hypotony on wound contraction of, 138; influence of pure salt solutions on, 140; high calcium requirement of, 143; low potassium requirement of, 144; mass protection from ultra-violet radiation in, 509; effect of ultra-violet radiation on, 513

*Platynereis:* susceptibility to hypotonic sea-water of egg of, 122, 128, 130

Polarity: in reconstitution of *Pelmatohydra oligactis*, 188; in cell aggregates of *Corymorpha palma*, 419, 429; origin of, in *Corymorpha* cell aggregates, 433, 437, 451, 453; first indication of, in *Corymorpha* cell aggregates, 451

POMMERENKE, W. T., Effects of sperm injections into female rabbits, 97

*Popillia japonica* Newman: effect of temperature on development of, 358; toleration of extreme temperatures by various stages of, 371; temperature coefficients of development of, 377; temperature characteristics of development of,

379; application of Krogh's formula to development of, 381; effect of alternating, as compared with constant temperatures on development of, 384

Potassium cyanide: influence of, on cleavage in *Arbacia*, 269; differential susceptibility to, in early stages of reconstitution of *Pelmatohydra oligactis*, 211

Potassium ion, effect of, on heart rhythm of crayfish, 580, 589

Protoplasmic reorganization in *Uronychia uncinata* during fission and regeneration, 1

Rabbits, effect of sperm injections into female, 97

Radiant energy, effect of, on insect gas exchange, 390

*Rana aurora draytoni:* influence of different parts of hypophysis on growth of, 153, removal and implantation of hypophysis in tadpoles of, 156; influence of intermediate lobe of hypophysis on pigmentation of tadpoles of, 157; influence of anterior lobe of hypophysis on growth of tadpoles of, 164

*Rana pipiens:* skin transplantation in tadpoles of, 475; transplantation of annular tympanic cartilage in tadpoles of, 481

Rats: nature of apparent geotropism of young, 550; geokinesis in young, 555

Reconstitution: in *Pelmatohydra oligactis*, 188; forms resulting from, in *Pelmatohydra oligactis*, 189, 190, 192

Redifferentiation in *Uronychia uncinata*, 8, 10, 19

Regeneration: in *Uronychia uncinata*, 10; of ovary in mice, 45

Regulation of respiration in crayfish, 76

Rejuvenescence in *Uronychia uncinata*, 22

Respiration: regulation of, in crayfish, 76; of ant in winter, 341

Respiratory movements, regularity of, in Locustidae, 593

Sebright bantams, influence of gonads on plumage of, 286

Serum calcium, increase in, following uranium-nitrate injection in parathyroidectomized dogs, 501

Shipworm, physiology of pallet mechanism of, 416

SLIFER, E. H., and HERBER, E. C., The regularity of respiratory movements of Locustidae, 593

Sodium ion, effect of, on heart rhythm of crayfish, 579, 589

SPENCER, G. EDWARD, A source of error in metabolic gas-exchange measurements, 390

Sperm injections, effect of, on female rabbits, 97

Spermatotoxins: occurrence of, 97; in female rabbit, 104, 111, 116; specificity of, 114

Spermatozoa, effect of injection of, into female rabbits, 97

STANLEY, P.; SWINGLE, W. W.; and WENNER, W. F., The effect of $CO_2$ administration upon parathyroid tetany, 172

Starfish egg: localization and fusion of blastomeres from egg fragments in, 45; method of operation on, 56; development of fragments of, 58, 66

Sugar content during molt cycle of crabs, 545

Sulphate retention: in dogs, following bilateral adrenal extirpation, 37; method of determining, 39

Susceptibility: period of maximum, to dilute sea-water in cleavage cycle of *Arbacia*, 26; of *Nereis* eggs to hypotonic sea-water, 124, 129; in early stages of reconstitution of *Pelmatohydra oligactis*, 211; of dividing *Paramecium* to ultraviolet radiation, 394, 409; of different cells of *Paramecium* chains to ultraviolet radiation, 407

SWINGLE, W. W., The relief of parathyroid tetany by injections of uranium nitrate, 496

SWINGLE, W. W., and WENNER, W. F., Sulphate retention in dogs following bilateral adrenal extirpation, 37

SWINGLE, W. W.; WENNER, W. F.; and STANLEY, P., The effect of $CO_2$ administration upon parathyroid tetany, 172

TAYLOR, C. V., Protoplasmic reorganization in *Uronychia uncinata*, sp. nov., during binary fission and regeneration, 1

Temperature: in nest of ant during winter, 328; of ant aggregations, 344; the chief factor in hibernation and emergence of ant, *Formica ulkei*, 351; effect on insect development of, 358

Temperature characteristics for development of *Popillia japonica*, 379

Temperature coefficients of development of *Popillia japonica*, 377

Temperature gradient: effect of, on development of *Triturus torosus*, 231; method of establishing, 232; abnormalities resulting from, 245; modification of physiological pattern by, 258

*Teredo navalis*, physiology of pallet mechanism of, 416

Thyroid: effect of removal and implantation of hypophysis on development of, in tadpoles, 161; growth of tadpoles after removal of, 161

Transplantation: of skin in tadpoles of *Rana pipiens*, 466, 475; of annular tympanic cartilage in tadpoles of *Rana pipiens*, 481

*Triturus torosus:* effect of temperature gradient on development of, 231; abnormalities in development of, resulting from subjection to temperature gradient, 245

Tympanic cartilage, influence of, on formation of tympanic membrane, 463

Tympanic membrane: influence of tympanic cartilage on formation of, 463, 491; histological constitution of, 464; formation of, in frog, 467

Ultra-violet radiation: effect of, on division in *Paramecium caudatum*, 394; permanent pairs and chains of *Paramecium caudatum* resulting from action of, 404; higher susceptibility of dividing *Paramecium* to, 409; monster formation in *Paramecium* by, 409; mass protection for *Planaria* from, 509; effect of, on *Planaria*, 513

Unipolar forms: in the reconstitution of *Pelmatohydra oligactis*, 189; in cell aggregates from *Corymorpha palma*, 429, 452

Uranium nitrate, relief of parathyroid tetany by injections of, 496

*Uronychia uncinata*, sp. nov.: protoplasmic reorganization during binary fission and regeneration in, 1; method of operation on, 2; description of, 3; specific characters of, 7; binary fission in, 8; dedifferentiation and redifferentiation in, 8, 10, 19; regeneration in, 10; transection of, 13; incisions into, 16; rejuvenescence in, 22

Water content: of worker ants during winter, 336; of crabs during molt cycle, 531, 534

WEIMER, BERNAL R., The physiological gradients in *Hydra*. I. Reconstitution and budding in relation to length of piece and body level in *Pelmatohydra oligactis*, 183

WENNER, W. F., and SWINGLE, W. W., Sulphate retention in dogs following bilateral adrenal extirpation, 37

WENNER, W. F.; SWINGLE, W. W.; and STANLEY, P., The effect of $CO_2$ administration upon parathyroid tetany, 172

WHITAKER, D. M., Localization in the starfish egg and fusion of blastulae from egg fragments, 55